

2009 Annual Tuberculosis Surveillance Report

Virginia Department of Health

Office of Epidemiology

**Division of Disease Prevention
Tuberculosis Control**

August 2010

**Suggested Citation: Virginia Department of Health, Office of Epidemiology,
Division of Disease Prevention, 2009 Annual Tuberculosis Surveillance Report,
August 2010.**

Office of Epidemiology	Keri Hall, MD Director
Division of Disease Prevention	Kathryn Hafford, RN, MS Director
Tuberculosis Control.....	Jane Moore, RN, MHSA Director
Clinical and Case Management Consultation.....	Brenda Mayes, RN Nurse Consultant
	Debbie Staley, RN, MPH Nurse Consultant
Contact and Outbreak Investigation Consultation.....	Paul Regan Public Health Advisor
Health Education.....	Lauri S. Savage, MBA TB Health Educator
Surveillance and Epidemiology.....	Suzanne J. Keller, MA Surveillance Coordinator/Epidemiologist
	Timothy J. Epps TB Program Specialist
	William J. White TB Program Specialist
	Donna Asby-Green TB Registrar

For more information contact:

Division of Disease Prevention
Tuberculosis Control
109 Governor Street
P.O. Box 2448, Rm 326
Richmond, Virginia 23219
Telephone: 804/864-7906
Fax: 804/371-0248

Internet:

<http://www.vdh.virginia.gov/Epidemiology/DiseasePrevention/Programs/Tuberculosis/index.htm>

Acknowledgements

This report was prepared by

Suzanne Keller, MA
Surveillance Coordinator/Epidemiologist

The Tuberculosis Control staff within the Division of Disease Prevention would like to extend thanks and appreciation to the public health nurses and outreach workers who provide services to patients and who provide the information and data summarized here.

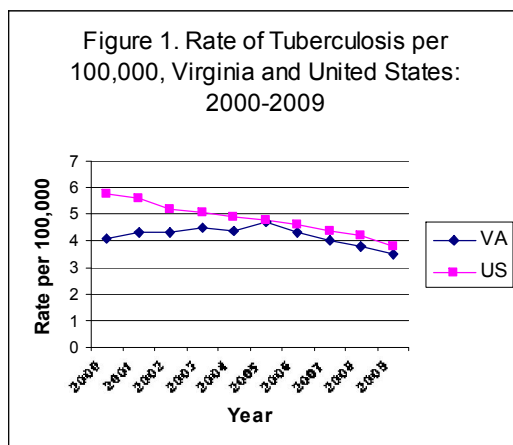
Contents

Epidemiology of Tuberculosis: 2009

Introduction	1
Demographic Characteristics.....	1
Geographic Distribution.....	1
HIV Co-infection and Selected Risk Factors.....	2
Drug Resistance.....	2
Mortality	2
Treatment Outcomes.....	2
Contact Investigations	2
Summary Data	
Table 1. Number and Rate per 100,000 of Tuberculosis Cases: Virginia and United States, 2000-2009.....	3
Table 2. Tuberculosis Cases and Rate per 100,000 by Health Region: Virginia, 2005-2009	3
Table 3. Tuberculosis Cases by Demographics and Location: Virginia, 2005-2009.....	4
Table 4. Tuberculosis Cases by Demographics and Region: Central, 2005-2009	5
Table 5. Tuberculosis Cases by Demographics and Region: Eastern, 2005-2009	5
Table 6. Tuberculosis Cases by Demographics and Region: Northern, 2005-2009.....	6
Table 7. Tuberculosis Cases by Demographics and Region: Northwest, 2005-2009.....	6
Table 8. Tuberculosis Cases by Demographics and Region: Southwest, 2005-2009	7
Table 9. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Virginia, 2005-2009	8
Table 10. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Central Region, 2005-2009.....	8
Table 11. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Eastern Region, 2005-2009	9
Table 12. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northern Region, 2005-2009	9
Table 13. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northwest Region, 2005-2009	10
Table 14. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Southwest Region, 2005-2009.....	10
Table 15. Tuberculosis Cases by Selected Risk Factors: Virginia, 2005-2009	11
Table 16. Tuberculosis Cases by Selected Risk Factors: Central Region, 2005-2009	11
Table 17. Tuberculosis Cases by Selected Risk Factors: Eastern Region, 2005-2009.....	12
Table 18. Tuberculosis Cases by Selected Risk Factors: Northern Region, 2005-2009	12
Table 19. Tuberculosis Cases by Selected Risk Factors: Northwest Region, 2005-2009	13
Table 20. Tuberculosis Cases by Selected Risk Factors: Southwest Region, 2005-2009	13
Table 21. Tuberculosis Cases with Drug Resistance: Virginia, 2005-2009.....	14
Table 22. Tuberculosis Mortality: Virginia, 2005-2009	14
Technical Notes	15-16

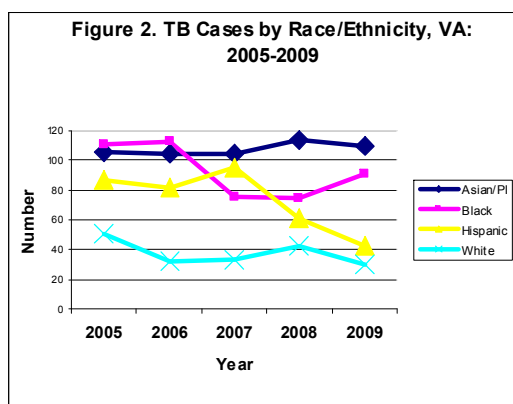
Introduction

In 2009, Virginia reported 273 *Mycobacterium tuberculosis* (TB) cases, a 6.5% decrease from the 292 cases in 2008. Nationally in 2009 TB cases reached the lowest number and lowest rate since reporting began in 1954. Virginia ranks 10th in the nation for reported TB cases with a case rate of 3.5 per hundred thousand compared to 3.8 for the United States. In this report, data on demographics and selected risk factors are provided at the state and health region level for 2005 to 2009.



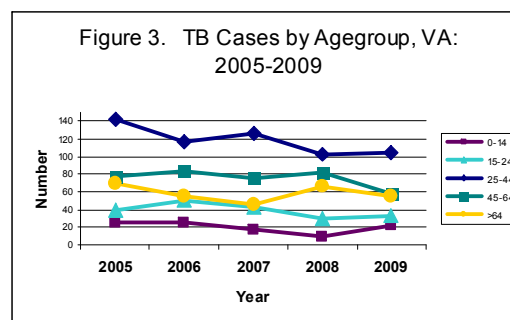
Sex and Race

In 2009, 44.3% of TB cases were female and 55.7% were male. Among racial and ethnic groups, the most substantial declines occurred among Hispanics and Whites with a decrease of 31% and 29% respectively when compared to 2008. Increases occurred among Blacks and cases among Asians were flat in 2009. (Figure 2).



Age

Twenty-two pediatric cases, aged 0 to 14, were reported in 2009 as compared to 10 cases in 2008. Pediatric cases, especially among those aged 0-4 are a bellwether for ongoing transmission of TB in the community. *In 2009 11 children aged 0-4 were reported with TB.* Among the 15-24 year old age group, 33 cases were reported compared to 30 cases in 2008. The 25-44 year old age also remained flat with 104 cases reported compared to 103 in 2008. Substantial decreases were seen in those aged 45-64 with 59 cases reported compared to 82 cases in 2008. Similarly those aged 65 and older decreased from 67 in 2008 to 55 in 2009 (Figure 3).



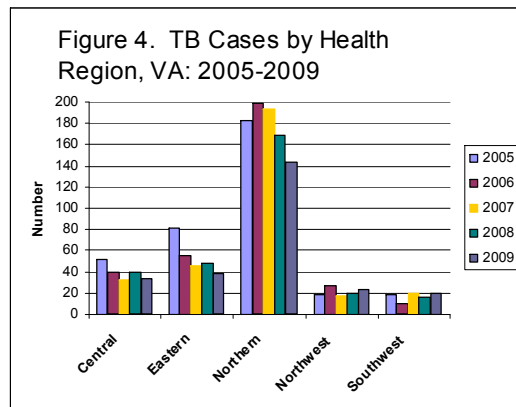
Place of Origin

Since 2000, foreign-born cases have surpassed US-born cases. In 2009, 190 or 69.6% of Virginia's TB cases were reported among foreign-born persons. Foreign-born cases declined by 10.4% compared to 2008. The number of cases reported among US-born persons is virtually unchanged from 2008.

The diversity of cultures and countries of origin among Virginia's TB cases is remarkable. These cases represent 42 countries of origin and speak 22 languages other than English. The top five countries of origin include Ethiopia, Viet Nam, India, the Philippines, and Nepal.

Geographic Distribution

The distribution of TB cases in Virginia is quite stable with the majority of cases (57.9%) reported from the Northern Health Region. Central, Eastern and Northern reported small decreases over 2008. Northwest and Southwest reported small increases (Figure 4).



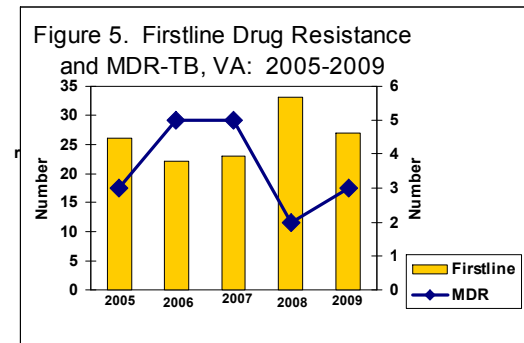
HIV Co-Infection and Selected Risk Factors

Several risk factors are associated with TB including occupational risk, congregate living, co-infection with HIV, homelessness, substance use and diabetes. In 2009, 11 health care workers were reported with TB. TB was reported in 3 residents of long-term care facilities, 4 incarcerated persons and 9 homeless persons. Overall, 18 (6.6%) of Virginia's cases were reported with HIV infection as compared to 9 (3.1%) of cases in 2008. In 2009, 21 cases (7.7%) reported excessive alcohol use and 12 cases (4.4%) reported illicit drug use. Diabetes was the most frequent risk reported with 37 cases (13.5%) reported in 2009.

Drug Resistance

Two hundred four TB cases were culture positive and had drug susceptibility testing performed. Drug resistance was found in 30 cases. Three cases of multidrug resistant TB (MDR-TB) were reported. (By definition MDR-TB is resistant to both isoniazid and rifampin). Resistance to at least one first-line drug, most frequently isoniazid, was found in 27 cases. No cases meeting the

definition of extensively drug-resistant (XDR) TB were reported in 2009 (Figure 5).



Mortality

In 2009, 11 (4.0%) TB cases died during treatment and two (0.7%) cases were diagnosed at the time of death or post-mortem. Of note, three cases had HIV co-infection and three cases had diabetes. Moreover 39% of these deaths occurred in person under the age of 45.

Treatment Outcomes

For 2008, the year with the most complete data available, 90.3% of the drug-susceptible cases completed therapy within 12 months.

Contact Investigations

In 2008, 2,878 contacts to acid-fast bacilli (AFB) smear positive, culture positive cases were identified. Of those, 90% were evaluated for infection and disease. Among the 402 people identified with latent TB infection (LTBI), 233(58%) were started on treatment and 150 (64%) completed treatment for latent TB infection.

Table 1. Number and Rate of Tuberculosis Cases: Virginia and United States, 2000-2009

Year	Virginia		United States	
	No.	Rate	No.	Rate
2000	292	4.1	16,310	5.8
2001	306	4.3	15,945	5.6
2002	315	4.3	15,056	5.2
2003	332	4.5	14,836	5.1
2004	329	4.4	14,500	4.9
2005	355	4.7	14,067	4.8
2006	332	4.3	13,727	4.6
2007	309	4.0	13,288	4.4
2008	292	3.8	12,904	4.2
2009	273	3.5	11,540	3.8

Historical US data from : CDC. Reported Tuberculosis in the United States, 2008. Atlanta, GA: US DHHS, CDC, September 2009.

2009 US data from: Decrease in Reported TB Cases---United States, 2009 MMWR 2010; 59(10): 289-294.

Table 2. Tuberculosis Cases and Rate per 100,000 by Health Region: Virginia, 2005-2009

Region	2005			2006			2007			2008			2009		
	No.	%	Rate	No.	%	Rate	No.	%	Rate	No.	%	Rate	No.	%	Rate
Total	355	100	4.7	332	100	4.3	309	100	4.0	292	100	3.8	273	100	3.5
Central	52	14.6	4.0	40	12.0	3.1	32	10.4	2.4	39	13.4	2.9	33	12.1	2.5
Eastern	82	23.1	4.6	56	16.9	3.1	46	14.9	2.6	48	16.4	2.7	38	13.9	2.1
Northern	183	51.5	9.0	199	59.9	9.7	194	62.8	9.3	169	57.9	8.0	158	57.9	7.3
Northwest	19	5.4	1.6	27	8.1	2.3	17	5.5	1.4	20	6.8	1.7	24	8.8	2.0
Southwest	19	5.4	1.4	10	3.0	0.8	20	6.5	1.5	16	5.5	1.2	20	7.3	1.5

Table 3. Tuberculosis Cases by Demographics and Location: Virginia, 2005-2009

	2005		2006		2007		2008		2009	
Total Cases	355		332		309		292		273	
	No	%	No	%	No	%	No	%	No	%
Sex										
Female	173	48.7	142	42.8	129	41.7	123	42.1	121	44.3
Male	182	51.3	190	57.2	180	58.3	169	57.9	152	55.7
Race/Ethnicity										
Asian/Pacific Islander	106	29.9	105	31.6	105	34.0	114	39.0	110	40.3
Black, Not Hispanic	111	31.3	113	34.0	76	24.6	75	25.7	91	33.3
Hispanic	87	24.5	82	24.7	95	30.7	61	20.9	42	15.4
White, Not Hispanic	51	14.4	32	9.6	33	10.7	42	14.4	30	11.0
Other	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Age										
0-14	26	7.3	25	7.5	17	5.5	10	3.4	22	8.1
15-24	40	11.3	51	15.4	43	13.9	30	10.3	33	12.1
25-44	142	40.0	117	35.2	127	41.1	103	35.3	104	38.1
45-64	78	22.0	84	25.3	76	24.6	82	28.1	59	21.6
>64	69	19.4	55	16.6	46	14.9	67	22.9	55	20.1
Place of Birth										
Foreign-born	225	63.4	230	69.3	230	74.4	212	72.6	190	69.6
US-born	130	36.6	102	30.7	79	25.6	80	27.4	83	30.4
Health Region										
Central	52	14.6	40	12.0	32	10.4	39	13.4	33	12.1
Eastern	82	23.1	56	16.9	46	14.9	48	16.4	38	13.9
Northern	183	51.5	199	59.9	194	62.8	169	57.9	158	57.9
Northwest	19	5.4	27	8.1	17	5.5	20	6.8	24	8.8
Southwest	19	5.4	10	3.0	20	6.5	16	5.5	20	7.3

Table 4. Tuberculosis Cases by Demographics and Region: Central, 2005-2009

	2005		2006		2007		2008		2009	
	52		40		32		39		33	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	24	46.2	12	30.0	12	37.5	13	33.3	13	39.4
Male	28	53.8	28	70.0	20	62.5	26	66.7	20	60.6
Race/Ethnicity										
Asian/Pacific Islander	11	21.2	6	15.0	1	3.1	10	25.6	4	12.1
Black, Not Hispanic	27	51.9	24	60.0	19	59.4	17	43.6	23	69.7
Hispanic	5	9.6	3	7.5	8	25.0	7	17.9	2	6.1
White, Not Hispanic	9	17.3	7	17.5	4	12.5	5	12.8	4	12.1
Age										
0-14	4	7.7	2	5.0	2	6.3	2	5.1	5	15.2
15-24	6	11.5	3	7.5	8	25.0	8	20.5	3	9.1
25-44	18	34.6	12	30.0	8	25.0	14	35.9	12	36.4
45-64	16	30.8	14	35.0	9	28.1	7	17.9	5	15.2
>64	8	15.4	9	22.5	5	15.6	8	20.5	8	24.2
Place of Birth										
Foreign-born	18	34.6	11	27.5	13	40.6	16	41.0	8	24.2
US Born	34	65.4	29	72.5	19	59.4	23	59.0	25	75.8

Table 5. Tuberculosis Cases by Demographics and Region: Eastern, 2005-2009

	2005		2006		2007		2008		2009	
	82		56		46		48		38	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	32	39.0	30	53.6	19	41.3	28	58.3	15	39.5
Male	50	61.0	26	46.4	27	58.7	20	41.7	23	60.5
Race/Ethnicity										
Asian/Pacific Islander	14	17.1	12	21.4	17	37.0	16	33.3	11	28.9
Black, Not Hispanic	45	54.9	33	58.9	19	41.3	16	33.3	17	44.7
Hispanic	9	11.0	9	16.1	4	8.7	5	10.4	4	10.5
White, Not Hispanic	14	17.1	2	3.6	6	13.0	11	22.9	6	15.8
Age										
0-14	7	8.5	5	8.9	1	2.2	2	4.2	5	13.2
15-24	6	7.3	9	16.1	1	2.2	4	8.3	1	2.6
25-44	30	36.6	12	21.4	13	28.3	11	22.9	10	26.3
45-64	16	19.5	13	23.2	21	45.7	13	27.1	11	28.9
>64	23	28.0	17	30.4	10	21.7	18	37.5	11	28.9
Place of Birth										
Foreign-born	29	35.4	20	35.7	20	43.5	24	50.0	14	36.8
US-born	53	64.6	36	64.3	26	56.5	24	50.0	24	63.2

Table 6. Tuberculosis Cases by Demographics and Region: Northern, 2005-2009

	2005		2006		2007		2008		2009	
Total Cases	183		199		194		169		158	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	104	56.8	90	45.2	85	43.8	74	43.8	76	48.1
Male	79	43.2	109	54.8	109	56.2	95	56.2	82	51.9
Race/Ethnicity										
Asian/Pacific Islander	78	42.6	85	42.7	81	41.8	79	46.7	86	54.4
Black, Not Hispanic	26	14.2	48	24.1	29	14.9	35	20.7	36	22.8
Hispanic	66	36.1	54	27.1	77	39.7	40	23.7	27	17.1
White, Not Hispanic	13	7.1	12	6.0	7	3.6	15	8.9	9	5.7
Age										
0-14	13	7.1	14	7.0	12	6.2	4	2.4	7	4.4
15-24	22	12.0	34	17.1	30	15.5	15	8.9	20	12.7
25-44	87	47.5	81	40.7	94	48.5	65	38.5	69	43.7
45-64	33	18.0	48	24.1	38	19.6	51	30.2	35	22.2
>64	28	15.3	22	11.1	20	10.3	34	20.1	27	17.1
Place of Birth										
Foreign-born	163	89.1	179	89.9	179	92.3	153	90.5	143	90.5
US-born	20	10.9	20	10.1	15	7.7	16	9.5	15	9.5

Table 7. Tuberculosis Cases by Demographics and Region: Northwest, 2005-2009

	2005		2006		2007		2008		2009	
Total Cases	19		27		17		20		24	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	9	47.4	9	33.3	8	47.1	5	25.0	6	25.0
Male	10	52.6	18	66.7	9	52.9	15	75.0	18	75.0
Race/Ethnicity										
Asian/Pacific Islander	1	5.3	2	7.4	4	23.5	5	25.0	6	25.0
Black, Not Hispanic	8	42.1	7	25.9	3	17.6	4	20.0	6	25.0
Hispanic	5	26.3	15	55.6	5	29.4	7	35.0	7	29.2
White, Not Hispanic	5	26.3	3	11.1	5	29.4	4	20.0	5	20.8
Age										
0-14	1	5.3	3	11.1	0	0.0	2	10.0	1	4.2
15-24	5	26.3	4	14.8	0	0.0	3	15.0	6	25.0
25-44	3	15.8	10	37.0	9	52.9	7	35.0	10	41.7
45-64	8	42.1	6	22.2	5	29.4	7	35.0	6	25.0
>64	2	10.5	4	14.8	3	17.6	1	5.0	1	4.2
Place of Birth										
Foreign-born	9	47.4	20	74.1	10	58.8	12	60.0	18	75.0
US-born	10	52.6	7	25.9	7	41.2	8	40.0	6	25.0

Table 8. Tuberculosis Cases by Demographics and Region: Southwest, 2005-2009

	2005		2006		2007		2008		2009	
Total Cases	19		10		20		16		20	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	4	21.1	1	10.0	5	25.0	3	18.8	11	55.0
Male	15	78.9	9	90.0	15	75.0	13	81.3	9	45.0
Race/Ethnicity										
Asian/Pacific Islander	2	10.5	0	0.0	2	10.0	4	25.0	3	15.0
Black, Not Hispanic	4	21.1	1	10.0	6	30.0	3	18.8	9	45.0
Hispanic	2	10.5	1	10.0	2	10.0	2	12.5	3	15.0
White, Not Hispanic	11	57.9	8	80.0	10	50.0	7	43.8	5	25.0
Age										
0-14	1	5.3	1	10.0	2	10.0	0	0.0	4	20.0
15-24	1	5.3	1	10.0	4	20.0	0	0.0	3	15.0
25-44	4	21.1	2	20.0	3	15.0	7	43.8	3	15.0
45-64	5	26.3	3	30.0	3	15.0	3	18.8	2	10.0
>64	8	42.1	3	30.0	8	40.0	6	37.5	8	40.0
Place of Birth										
Foreign-born	6	31.6	0	0.0	8	40.0	7	43.8	7	35.0
US-born	13	68.4	10	100.0	12	60.0	9	56.3	13	65.0

Table 9. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Virginia, 2005-2009

Race/Ethnicity	2005		2006		2007		2008		2009	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	129	226	101	231	79	230	80	212	83	190
Asian/Pacific Islander	5	101	5	100	3	102	3	111	7	103
Black, Not Hispanic	76	36	62	51	45	31	37	38	48	43
Hispanic	8	79	8	74	5	90	3	58	3	40
White, Not Hispanic	40	10	26	6	26	7	37	5	25	4

Table 10. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Central Region, 2005-2009

Race/Ethnicity	2005		2006		2007		2008		2009	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	34	18	29	11	19	13	23	16	25	8
Asian/Pacific Islander	2	9	0	6	0	1	1	9	0	4
Black, Not Hispanic	24	3	21	3	14	5	17	0	21	2
Hispanic	0	5	1	2	1	7	0	7	0	2
White, Not Hispanic	8	1	7	0	4	0	5	0	4	0

Table 11. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Eastern Region, 2005-2009

Race/Ethnicity	2005		2006		2007		2008		2009	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	53	29	36	20	26	20	24	24	24	14
Asian/Pacific Islander	1	13	1	11	1	16	0	16	1	10
Black, Not Hispanic	39	6	32	1	19	0	13	3	16	1
Hispanic	0	9	1	8	1	3	1	4	1	3
White, Not Hispanic	13	1	2	0	5	1	10	1	6	0

Table 12. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northern Region, 2005-2009

Race/Ethnicity	2005		2006		2007		2008		2009	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	20	163	20	179	15	179	16	153	15	143
Asian/Pacific Islander	2	76	4	81	2	79	2	77	5	81
Black, Not Hispanic	3	23	4	44	7	22	2	33	2	34
Hispanic	8	58	4	50	3	74	1	39	1	26
White, Not Hispanic	7	6	8	4	3	4	11	4	7	2

Table 13. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northwest Region, 2005-2009

Race/Ethnicity	2005		2006		2007		2008		2009	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	10	9	7	20	7	10	8	12	6	18
Asian/Pacific Islander	0	1	0	2	0	4	0	5	0	6
Black, Not Hispanic	5	3	4	3	2	1	3	1	3	3
Hispanic	0	5	1	14	0	4	1	6	0	7
White, Not Hispanic	5	0	2	1	5	1	4	0	3	2
Other	0	0	0	0	0	0	0	0	0	0

Table 14. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Southwest Region, 2005-2009

Race/Ethnicity	2005		2006		2007		2008		2009	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	13	6	10	0	12	8	9	7	13	7
Asian/Pacific Islander	0	2	0	0	0	2	0	4	1	2
Black, Not Hispanic	3	1	1	0	0	3	2	1	6	3
Hispanic	0	2	1	0	3	2	0	2	1	2
White, Not Hispanic	10	1	8	0	9	1	7	0	5	0

Table 15. Tuberculosis Cases by Selected Risk Factors: Virginia, 2005-2009

Total Cases	2005		2006		2007		2008		2009	
	355		332		309		292		273	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	7	2.0	6	1.8	5	1.6	6	2.1	11	4.0
Migrant	4	1.1	1	0.3	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	13	3.7	13	3.9	2	0.6	5	1.7	3	1.1
Prison/Jail	8	2.3	4	1.2	6	1.9	5	1.7	4	1.5
Homeless	6	1.7	2	0.6	8	2.6	4	1.4	9	3.3
Co-Morbidity										
Diabetes	23	6.5	33	9.9	29	9.4	40	13.7	37	13.6
HIV	21	5.9	22	6.6	10	3.2	9	3.1	18	6.6
Substance Use										
Alcohol	34	9.6	28	8.4	25	8.1	19	6.5	21	7.7
IDU	2	0.6	6	1.8	5	1.6	0	0.0	6	2.2
Non-IDU	12	3.4	9	2.7	8	2.6	6	2.1	6	2.2

Table 16. Tuberculosis Cases by Selected Risk Factors: Central Region, 2005-2009

Total Cases	2005		2006		2007		2008		2009	
	52		40		32		39		39	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	0	0.0	1	2.5	0	0.0	0	0.0	1	2.6
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	3	5.8	1	2.5	0	0.0	1	2.6	0	0.0
Prison/Jail	2	3.8	0	0.0	2	6.3	1	2.6	1	2.6
Homeless	1	1.9	2	5.0	1	3.1	0	0.0	2	5.1
Co-Morbidity										
Diabetes	4	7.7	4	10.0	1	3.1	3	7.7	6	15.4
HIV	5	9.6	6	15.0	0	0.0	1	2.6	1	2.6
Substance Use										
Alcohol	7	13.5	8	20.0	4	12.5	3	7.7	7	17.9
IDU	0	0.0	6	15.0	0	0.0	0	0.0	2	5.1
Non-IDU	4	7.7	1	2.5	3	9.4	2	5.1	1	2.6

Table 17. Tuberculosis Cases by Selected Risk Factors: Eastern Region, 2005-2009

Total Cases	2005		2006		2007		2008		2009	
	82		56		46		48		38	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	1	1.2	0	0.0	1	2.2	0	0.0	0	0.0
Migrant	4	4.9	1	1.8	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	1	1.2	2	3.6	1	2.2	0	0.0	0	0.0
Prison/Jail	2	2.4	0	0.0	0	0.0	1	2.1	0	0.0
Homeless	3	3.7	0	0.0	2	4.3	0	0.0	1	2.6
Co-Morbidity										
Diabetes	8	9.8	7	12.5	4	8.7	9	18.8	7	18.4
HIV	6	7.3	4	7.1	3	6.5	1	2.1	2	5.3
Substance Use										
Alcohol	14	17.1	3	5.4	4	8.7	6	12.5	3	7.9
IDU	1	1.2	0	0.0	0	0.0	0	0.0	0	0.0
Non-IDU	5	6.1	3	5.4	4	8.7	2	4.2	1	2.6

Table 18. Tuberculosis Cases by Selected Risk Factors: Northern Region, 2005-2009

Total Cases	2005		2006		2007		2008		2009	
	183		199		194		169		158	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	5	2.7	5	2.5	3	1.5	5	3.0	8	5.1
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	7	3.8	3	1.5	0	0.0	4	2.4	3	1.9
Prison/Jail	2	1.1	1	0.5	1	0.5	2	1.2	0	0.0
Homeless	1	0.5	0	0.0	5	2.6	3	1.8	4	2.5
Co-Morbidity										
Diabetes	10	5.5	19	9.5	20	10.3	25	14.8	21	13.3
HIV	9	4.9	10	5.0	4	2.1	4	2.4	7	4.4
Substance Use										
Alcohol	5	2.7	5	2.5	8	4.1	7	4.1	7	4.4
IDU	0	0.0	0	0.0	1	0.5	0	0.0	1	0.6
Non-IDU	1	0.5	2	1.0	2	1.0	1	0.6	1	0.6

Table 19. Tuberculosis Cases by Selected Risk Factors: Northwest Region, 2005-2009

Total Cases	2005		2006		2007		2008		2009	
	19		28		17		20		24	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	1	5.3	0	0.0	1	5.9	1	5.0	2	8.3
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	0	0.0	4	14.3	0	0.0	0	0.0	0	0.0
Prison/Jail	1	5.3	3	10.7	1	5.9	1	5.0	4	16.7
Homeless	1	5.3	0	0.0	0	0.0	0	0.0	2	8.3
Co-Morbidity										
Diabetes	1	5.3	3	10.7	1	5.9	1	5.0	0	0.0
HIV	0	0.0	2	7.1	2	11.8	2	10.0	5	20.8
Substance Use										
Alcohol	1	5.3	7	25.0	3	17.6	2	10.0	3	12.5
IDU	0	0.0	0	0.0	2	0.0	0	0.0	2	0.0
Non-IDU	1	5.3	1	3.6	1	5.9	1	5.0	1	4.2

Table 20. Tuberculosis Cases by Selected Risk Factors: Southwest Region, 2005-2009

Total Cases	2005		2006		2007		2008		2009	
	19		10		20		16		20	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	2	10.5	3	30.0	1	5.0	0	0.0	0	0.0
Prison/Jail	1	5.3	0	0.0	2	10.0	0	0.0	0	0.0
Homeless	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0
Co-Morbidity										
Diabetes	0	0.0	0	0.0	3	15.0	2	12.5	3	15.0
HIV	0	0.0	0	0.0	1	5.0	1	6.3	3	15.0
Substance Use										
Alcohol	6	31.6	4	40.0	5	25.0	1	6.3	1	5.0
IDU	1	5.3	0	0.0	2	11.8	0	0.0	1	4.2
Non-IDU	1	5.3	2	20.0	0	0.0	0	0.0	2	10.0

Table 21. Culture Positive Tuberculosis Cases with Drug Resistance: Virginia, 2005-2009

Initial Susceptibilities	2005		2006		2007		2008		2009	
	260		253		219		219		204	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Drug Resistance	29	11.2	27	10.7	28	12.8	35	16.0	30	14.7
Any firstline drug	26	10.0	22	8.7	23	10.5	33	15.1	27	13.2
Multidrug**	3	1.2	5	2.0	5	2.3	2	0.9	3	1.5

**Multidrug resistance or MDR is by definition resistance to isoniazid and rifampin.

Table 6. Tuberculosis Mortality: Virginia, 2005-2009*

Total Cases	2005		2006		2007		2008		2009	
	355		332		309		292		273	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Deaths	31	8.7	27	8.1	11	3.6	20	6.8	13	4.8
Dead at Time Diagnosis	6	1.7	11	3.3	5	1.6	3	1.0	2	0.7
Died During Treatment	25	7.0	16	4.8	6	1.9	17	5.8	11	4.0

*If a person is diagnosed with TB post-mortem or diagnosed with TB at the time of death they are coded as dead at the time of diagnosis. If they died during TB treatment, they are coded as died during treatment. There may be people in either of these categories whose underlying cause of death is not TB.

Technical Notes

TB disease is a reportable condition as defined in the *Regulations for Disease Reporting and Control*. In addition, TB infection in children under age 4 is also a reportable condition. The Division of Disease Prevention, TB Control conducts surveillance for TB disease in the entire population and for TB infection among children. It collects, analyzes, and disseminates data as an integral part of TB control.

Rates per 100,000

In Table 1 rates for Virginia from 1994 to 1999 were calculated using population estimates provided by the Virginia Employment Commission. In Tables 1 and 2, rates for 2000-2006 were calculated using 2000 Census data released by the United States Bureau of the Census, Population Estimates Program. Annual Estimates of the Population for Counties of Virginia: April 1, 2000 to July 1, 2006 (CO-EST2006-01-51).

Definitions

Pediatric: In this report “pediatric” refers to persons up to and including the age of 14 years old.

Tuberculosis Case Definition¹

Cases confirmed as official morbidity in Virginia and included in this report meet the following case definition:

Clinical description

A chronic bacterial infection caused by *Mycobacterium tuberculosis*, characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs may be involved.

Clinical Case Definition

A case that meets the following criteria:

- A positive tuberculin skin test
- Other signs and symptoms compatible with tuberculosis (e.g., an abnormal, unstable [i.e., worsening or improving] chest radiograph, or clinical evidence of current disease)
- Treatment with two or more antituberculosis medications
- A completed diagnostic evaluation [to rule out other conditions]
- [Virginia also requires documented clinical improvement on treatment]

Laboratory criteria for diagnosis

- Isolation of *M. tuberculosis* from a clinical specimen* or
- Demonstration of *M. tuberculosis* from a clinical specimen by nucleic acid amplification test**, or
- Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained.

¹ CDC. Case Definitions for infectious conditions under public health surveillance. MMWR 1997;46 (No. RR-10):40-41.

Case classification

Confirmed: a case that meets the clinical case definition or is laboratory confirmed.

*Use of rapid identification techniques for *M. tuberculosis* (e.g., DNA probes and mycolic acids high-pressure liquid chromatography performed on a culture from a clinical specimen) are acceptable under this criterion.

**Nucleic acid amplification (NAA) tests must be accompanied by culture for mycobacteria species. However, for surveillance purposes, CDC will accept results obtained from NAA tests approved by the Food and Drug Administration (FDA) and used according to the approved product labeling on the package insert.